

Amendments to the Claims:

1. (Currently Amended) Reactor device (R) for carrying out chemical reactions requiring heat exchange, said reactor, which is elongate along an axis (XX'), having, at a first end, at least one means (16) for supplying at least one reactant and, at an opposite end, at least one means (18) for evacuating the effluents formed, and having a plurality of heat exchange means (12) separated by at least one internal partition (14) participating in controlling the residence time of the reactant or reactants and increasing the heat exchange surface inside the reactor, and passages for circulating the reactant or reactants and/or effluents, provided between said heat exchange means and said internal partitions, characterized in that the reactor (R) has at least one enclosure (10) made of a refractory material ensuring heat insulation and containing the heat exchange means (12) and the internal partitions (14), and in that said enclosure is contained in an envelope (20) containing the reactant or reactants and/or effluents circulating inside said reactor.

2. (Currently Amended) Device according to Claim 1 in which the internal partitions (14) are made of modular elements.

3. (Currently Amended) Device according to Claim 1, characterized in that the internal partitions (14) have recesses for receiving the heat exchange means (12).

4. (Currently Amended) Device according to Claim 2 in which the internal partitions (14) are formed of abutting modular elements with a shape designed to obtain the desired residence time inside the reactor for the

reactant or reactants and the effluents.

5. (Currently Amended) Device according to Claim 2 in which the internal partitions (14) are made of non-abutting modular elements with a shape designed to obtain the desired residence time inside the reactor for the reactant or reactants and the effluents.

6. (Currently Amended) Device according to Claim 1 in which the cross section of the containment envelope 20 is substantially quadrilateral in shape.

7. (Currently Amended) Device according to Claim 1, characterized by having an outer shell (22) whose cross section is substantially circular and whose inside diameter is substantially equal to the largest dimension of the outside diagonal of the containment envelope (20).

8. (Currently Amended) Device according to Claim 1 in which the enclosure (10) is made of an inorganic refractory material and the containment envelope (20) is made of a metal.

9. (Currently Amended) Device according to Claim 1 in which the enclosure (10) has linking and/or anchoring means to the containment envelope (20).

10. (Currently Amended) Device according to Claim 1 in which the enclosure (10) is made of a refractory material chosen from porous ceramics, nonporous ceramics, refractory concretes, and aluminous concretes.

11. (Currently Amended) Device according to Claim 1 in which the enclosure (10) is fitted to the containment envelope (20) in such a way as to prevent gas bypasses between the outside of said enclosure and the inside of said envelope.

12. (Currently Amended) Device according to Claim 1, characterized by having means for assembling and disassembling the heat exchange means (12) as well as the internal partitions (14) and at least one means for accessing the inside of reactor (R).

13. (Previously Presented) Use of the device according to Claim 1 to bring about thermal pyrolysis of a hydrocarbon feedstock included in the group of hydrocarbon feedstocks principally containing ethane and hydrocarbon feedstocks principally formed by naphtha.

14. (Previously Presented) Use of the device according to Claim 1 for bringing about a dehydrogenation reaction of hydrocarbon feedstock principally containing saturated hydrocarbons.

15. (Previously Presented) Use of the device according to Claim 1 to bring about a dehydrogenation reaction of a hydrocarbon feedstock chosen from the group formed by hydrocarbon feedstocks principally containing propane and by hydrocarbon feedstocks principally containing ethylbenzene.

16. (Previously Presented) Use of the device according to Claim 1 to bring about a thermal cracking reaction of a feedstock principally containing hydrogen sulfide.

17. (New) A method for using the device according to Claim 1, comprising supplying a hydrocarbon feedstock into the enclosure through the means for supplying at least one reactant, the hydrocarbon feedstock being selected from the group consisting of hydrocarbon feedstocks principally containing ethane and hydrocarbon feedstocks principally formed by naphtha, and bringing about thermal pyrolysis of the hydrocarbon feedstock in the enclosure.

18. (New) A method for using the device according to Claim 1, comprising supplying a hydrocarbon feedstock into the enclosure through the means for supplying at least one reactant, the hydrocarbon feedstock principally containing saturated hydrocarbons, and bringing about a dehydrogenation reaction of the hydrocarbon feedstock in the enclosure.

19. (New) A method for using the device according to Claim 1, comprising supplying a hydrocarbon feedstock into the enclosure through the means for supplying at least one reactant, the hydrocarbon feedstock being selected from the group consisting of hydrocarbon feedstocks principally containing propane and hydrocarbon feedstocks principally containing ethylbenzene, and bringing about a dehydrogenation reaction of the hydrocarbon feedstock in the enclosure.

20. (New) A method for using the device according to Claim 1, comprising supplying a hydrocarbon feedstock into the enclosure through the means for supplying at least one reactant, the hydrocarbon feedstock principally containing hydrogen sulfide, and bringing about a thermal cracking reaction of the hydrocarbon feedstock in the enclosure.

21. (New) Device according to Claim 11, wherein the outside of said enclosure is in direct contact with the inside of said envelope.

22. (New) Device according to Claim 11, wherein the outside of said enclosure has a section and dimension substantially equal to that of the inside of said envelope.

23. (New) Device according to Claim 1, wherein said enclosure substantially covers all internal walls of said envelope.